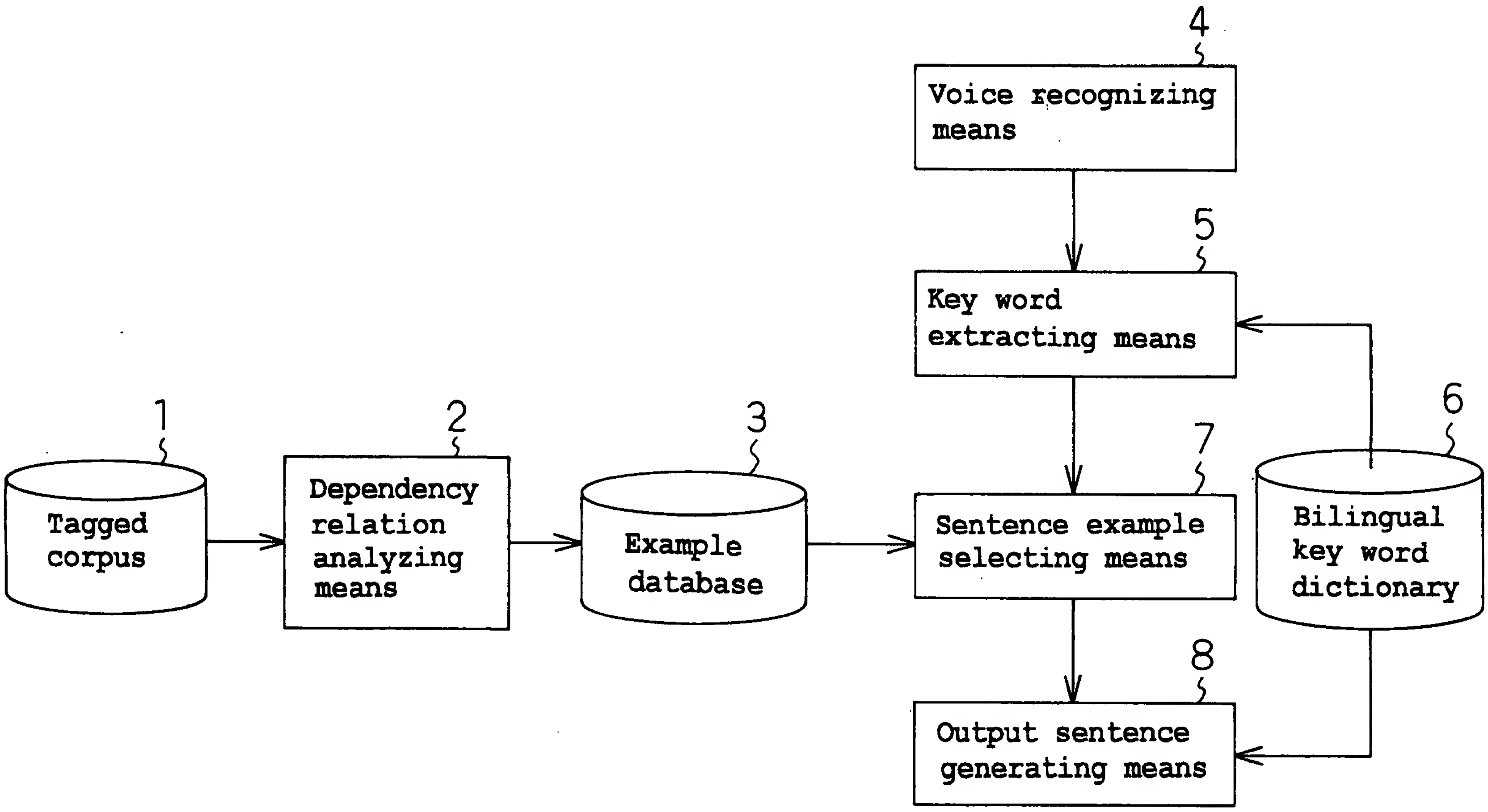
Fig. 1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Tagged corpus
2
Dependency relation analyzing means
3
Example database
4
Voice recognizing means
5
Key word extracting means
6
Bilingual key word dictionary
7
Sentence example selecting means
8
Output sentence generating means

Fig. 2 (a)

Example of bilingual key word dictionary

kohi [コーヒー] : coffee
onegai [お願い] : *
miruku [ミルク] : milk
tsumetai [冷たい] : cold
ari [あり] : *

Example of example DB

Dependency relation : Expression pattern
(kohi [コーヒー]→onegai [お願い]) : I'd like to coffee please.
(tsumetai [冷たい]→miruku [ミルク]) (miruku [ミルク]→ari [あり]) : Do you have a cold milk ?
. . .

Fig. 2 (b)

Example of tagged corpus

Kohi (common noun)| o (kaku-postpositional particle)| o (prefix)| negai (sahen-noun)| shi (verb)| masu (auxiliary verb)
[コーヒー (一般名詞) |を (格助詞) |お (接頭詞) |願い (サ変名詞) |し (動詞) |ます (助動詞)]

Tsumetai (adjective)| miruku (common noun)| ha (kei-postpositional particle)| ari (verb)| masu (auxiliary verb)| ka (shu-postpositional particle) ···
[冷たい (形容詞) |ミルク (普通名詞) |は (係助詞) |あり (動詞) |ます (助動詞) |か (終助詞)]
. . .

Fig. 3

Example of example DB

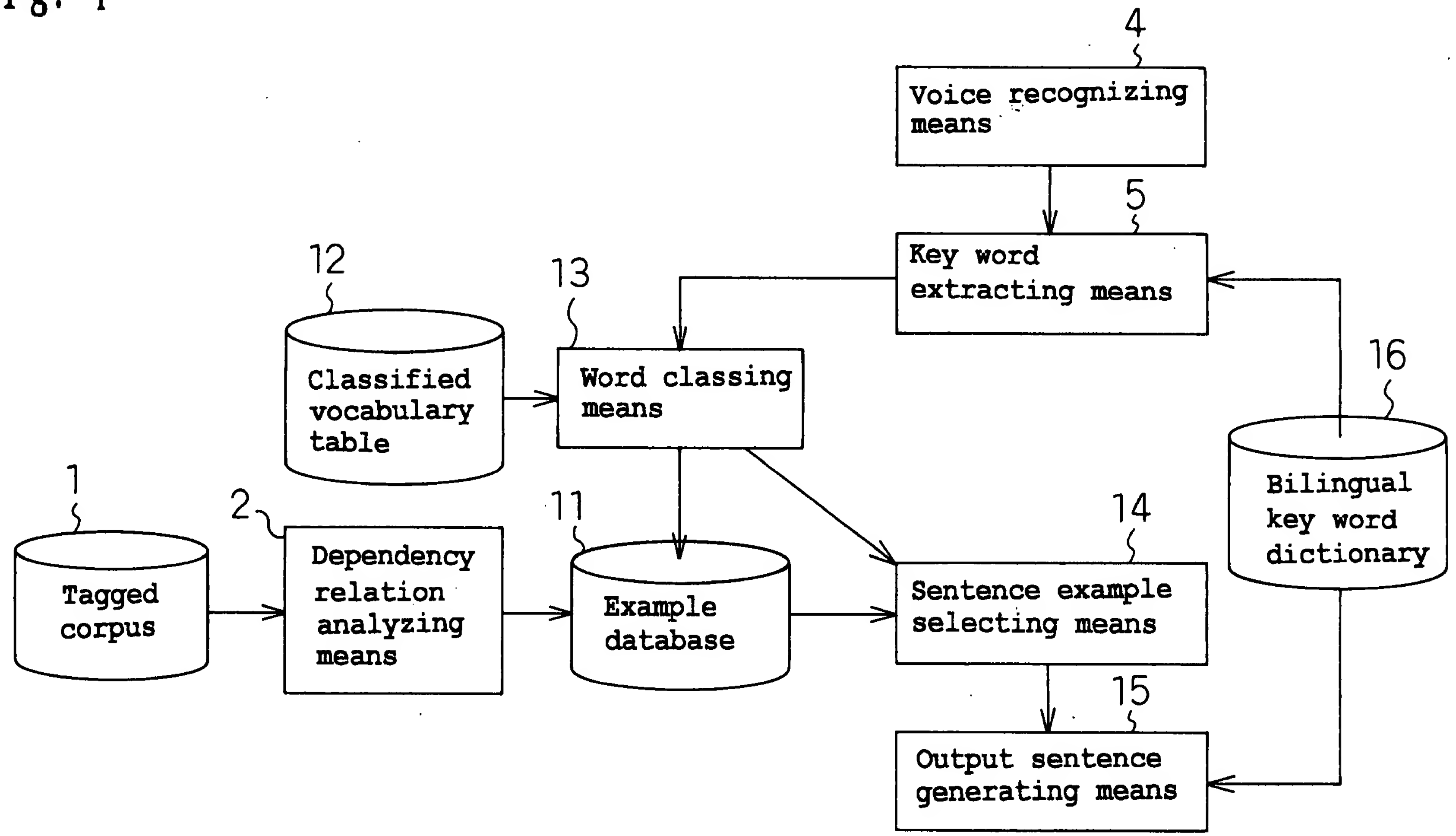
Dependency relation : **Expression pattern**

(kohi [コーヒー] →**onegai** [お願い]**)** : Coffee please.

(tsumetai [冷たい]→**miruku** [ミルク]**) (miruku** [ミルク]→**ari** [あり]**)** : Any cold milk?

. . .

Fig. 4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1
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Fig. 5 (a)

Classified vocabulary table

kohi [コーヒー]	(common noun [一般名詞])	100
miruku [ミルク]	(common noun [一般名詞])	100
koucha [紅茶]	(common noun [一般名詞])	100
...		
tsumetai [冷たい]	(adjective [形容詞])	200
atsui [熱い]	(adjective [形容詞])	200
...		

Fig. 5 (b)

Example of example DB

Key word	: Dependency relation	: Sentence example
① 100 ② onegai [お願い]	: (①→②)	: I'd like to ② please.
① 200 ② 100 ③ ari [あり]	: (①→②) (②→③)	: Do you have a ① ② ?
. . .		

Fig. 6

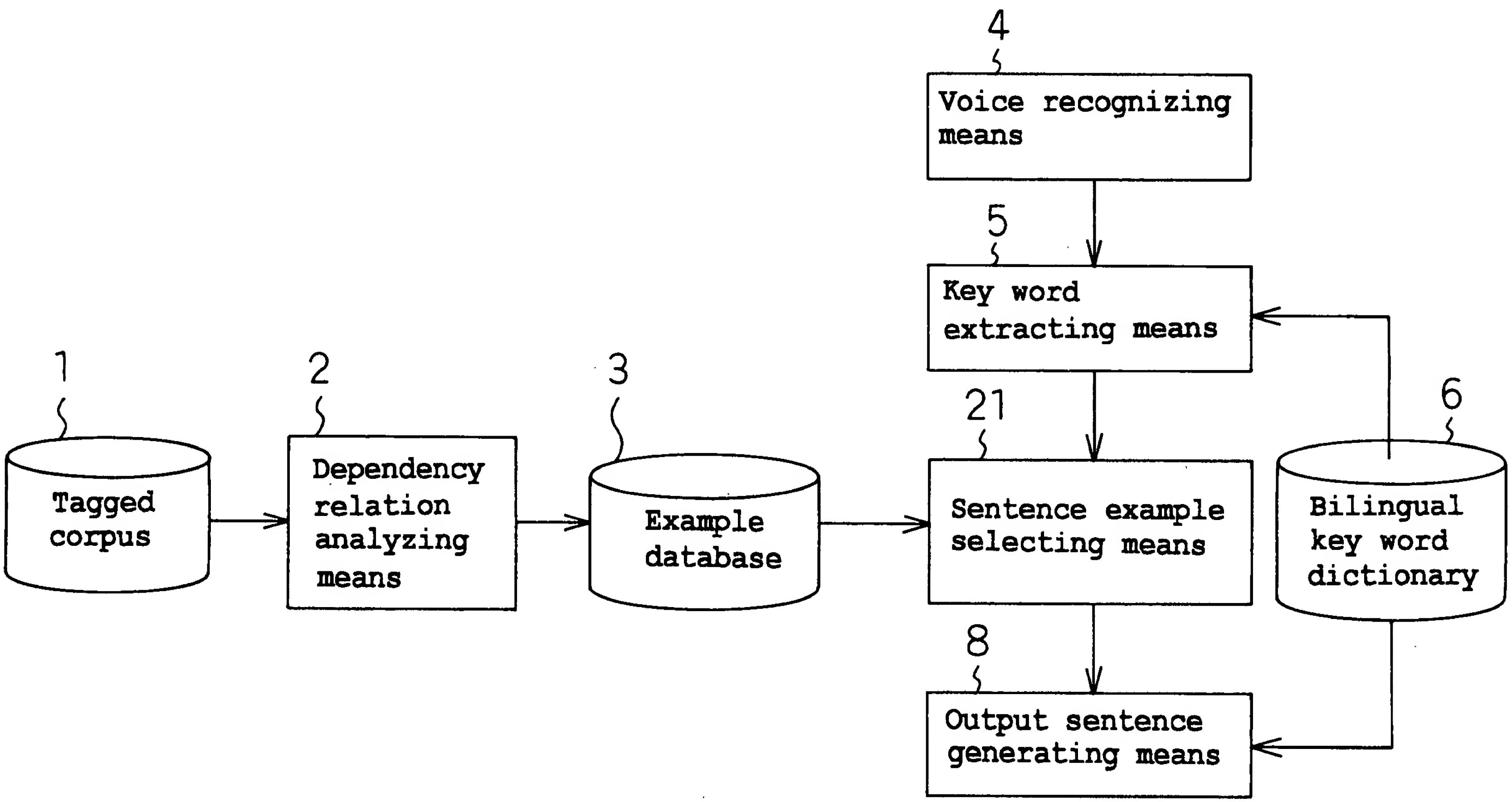

1
Tagged corpus
2
Dependency relation analyzing means
3
Example database
4
Voice recognizing means
5
Key word extracting means
21
Sentence example selecting means
8
Output sentence generating means
6
Bilingual key word dictionary

Fig. 7

Input sentence : Atsui miruku ha arimasuka [熱いミルクはありますか]

Recognition result sentence : Aoi miruku ha arimasuka [青いミルクはありますか]

Example of example DB

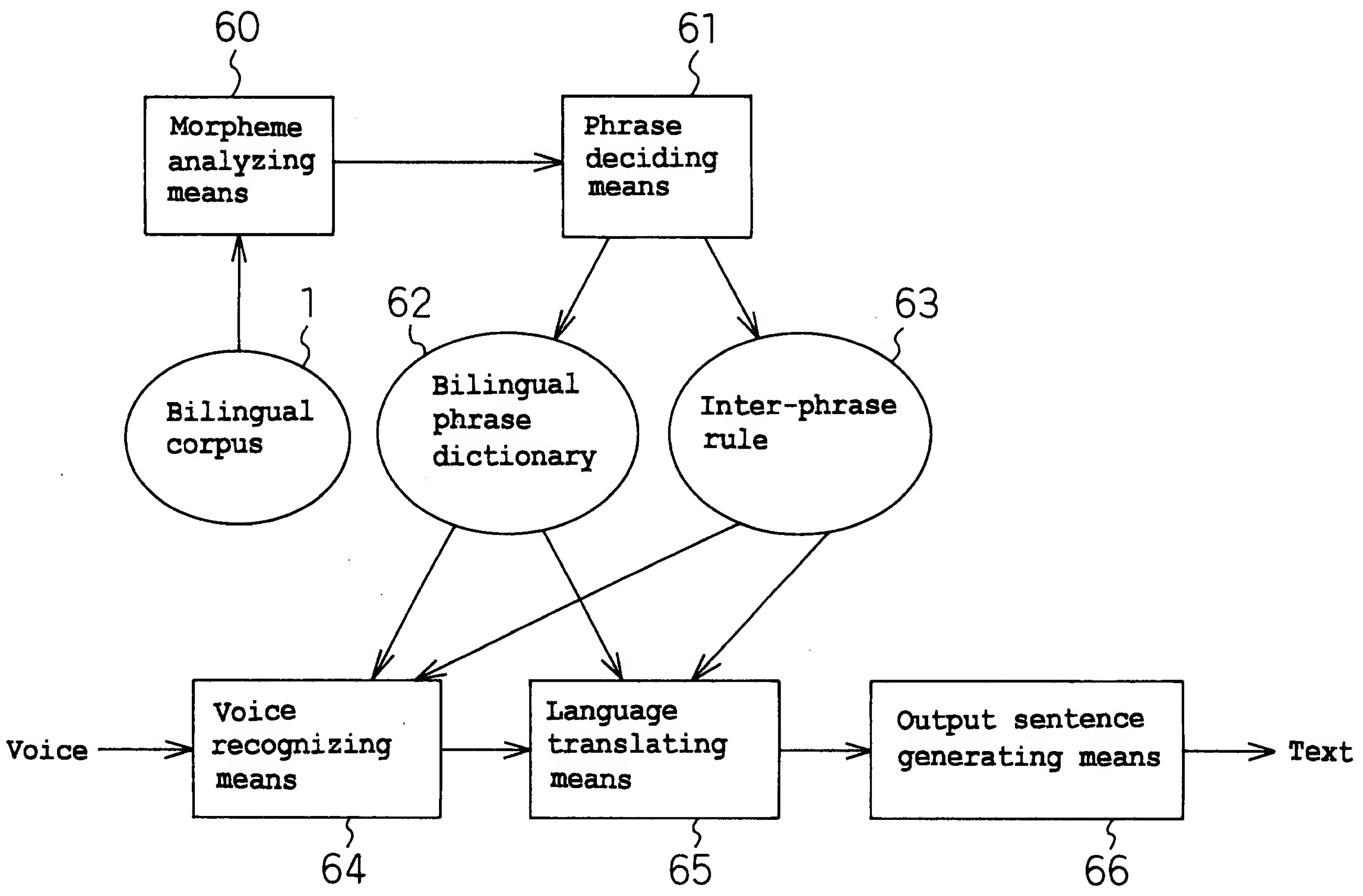
Dependency relation	Sentence example
(kohi [コーヒー]→onegai [お願い])	Coffee please.
(atsui [熱い]→miruku [ミルク]) (miruku [ミルク]→ari [あり])	Any hot milk ?
. . .	

Extracted key words : aoi [青い] , miruku [ミルク], ari [あり]

Result of dependency relation comparison between the key words and example DB :

(aoi [青い], miruku [ミルク]) ×
(aoi [青い], ari [あり]) ×
(miruku [ミルク], ari [あり]) ○

Fig. 8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Bilingual corpus
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Inter-phrase rule
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Fig. 9-1 (a)

70 Bilingual voiced sentence example

Heya no yoyaku o onegai shitain desuga
[部屋の予約をお願いしたいんですが]

I'd like to reserve a room.

Fig. 9-1 (b)

71 Bilingual phrase (A)

heya no yoyaku
[部屋の予約]

(reserve a room)

72 Bilingual phrase (B)

onegai shitain desuga
[お願いしたいんですが]

(I'd like to)

Fig. 9-1 (c)

62 Bilingual phrase dictionary

Japanese		English
X no Y [X の Y]	↔	(YX)
Z shitain desuga [Z したいんですが]	↔	(I'd like to)

Fig. 9-2 (d)

63 Inter-phrase rule

Japanese	English
(A) o (B) suru [(A)を(B) する] ↔	((B) to (A))

Fig. 9-2 (e)

64 Classified vocabulary table

X (heya [部屋], kaigishitsu [会議室], kuruma [車], …)
Y (yoyaku [予約], keiyaku [契約], …)
Z (onegai [お願い], tanomu [たのむ], …)
…

Fig. 10 (a)

Example of bilingual key word dictionary

coffee	:	kohi [コーヒー]
please	:	onegai [お願い]
milk	:	miruku [ミルク]
cold	:	tsumetai [冷たい]
have	:	ari [あり]

Example of example DB

Dependency relation	Expression pattern
(coffee→please)	: Kohi o onegai shimasu [コーヒーをお願いします]
(cold→milk) (milk→have)	: Tsumetai miruku ha arimasuka [冷たいミルクはありますか]
...	

Fig. 10 (b)

Example of tagged corpus

I (pronoun) | 'd (auxiliary verb) | like (verb) | to (determiner) | coffee (common noun) |
please (adverb) |
...

Fig. 11 (a)

Classified vocabulary table

coffee	(common noun)	100
milk	(common noun)	100
tea	(common noun)	100
...		
cold	(adjective)	200
hot	(adjective)	200
...		

Fig. 11 (b)

Example of example DB

Key word	Dependency relation	Sentence example
① 100 ② please	① o [を] ② shimasu [します]	① o [を] ② shimasu [します]
① 200 ② 100 ③ have	(①→②) (②→③)	①② ha [は] ③ masuka [ますか]
...		

Fig. 12

Input sentence : Do you have a hot milk ?

Recognition result sentence : Do you have a head milk ?

Example of example DB

Dependency relation	: Sentence example
(coffee→please)	: Kohi o onegai shimasu [コーヒーをお願いします]
(hot→milk) (milk→have)	: Atsui miruku ha arimasuka [熱いミルクはありますか]
...	

Extracted key words : (have, head, milk)

Result of dependency relation comparison between the key words and example DB :

(head, milk)	×
(head, have)	×
(milk, have)	○

Fig. 13 (a)

Example of bilingual key word dictionary

咖啡　: kohi [コーヒー]
要　: kudasai [下さい]
日文　: nihongo [日本語]
菜单　: menyu [メニュー]
有　: ari [あり]

Example of example DB

Dependency relation	: Expression pattern
(咖啡 →要)	: Kohi o kudasai [コーヒーを下さい]
(日文→菜单) (菜单→有)	: Nihongo no menyu ha arimasuka [日本語のメニューはありますか]
...	

Fig. 13 (b)

Example of tagged corpus

要（动）｜ 咖啡（名同）｜
...

Fig. 14 (a)

Classified vocabulary table

咖啡	(名)	100
牛奶	(名)	100
红茶	(名)	100
冷	(形)	200
热	(形)	200
日文	(名)	300
菜単	(名)	400
...		

Fig. 14 (b)

Example of example DB

Key word	: Dependency relation	: Sentence example
① 100 ② 要	:(①→②)	: ① o [を] ②
① 300 ② 400 ③ 有	:(①→②) (②→③)	: ① no [の] ② ha [は] ③ masuka [ますか]
	...	

Fig. 15

Input sentence : 有日文菜単吗
Recognition result sentence : 有日没菜単吗

Example of example DB

Dependency relation	Sentence example
(咖啡→要)	Kohi o kudasai [コーヒーを下さい]
(日文→菜単) (菜単→有)	Nihongo no menyu ha arimasuka [日本語のメニューはありますか]
	···

Extracted key words : (有, 日没, 菜単)

Result of dependency relation comparison between the key words and example DB :

(日没, 有) ×
(日没, 菜単) ×
(菜単, 有) ○